Wetland Studies and Solutions, Inc.®

Via U.S. Mail and Regulations.gov
November 1, 2010
Water Docket
Environmental Protection Agency
Mail code: 2822T
1200 Pennsylvania Ave., N.W.
Washington, D.C. 20460

RE: TMDL for the Chesapeake Bay Watershed
(Docket ID No. EPA-R03-OW-2010-0736)

Dear Sir or Madam:

We appreciate the opportunity to provide comments on the draft Chesapeake Bay Watershed TMDL. We believe that a TMDL which is equitable and cost effective will provide the greatest level of reasonable assurance resulting in a clean Chesapeake Bay. Additionally, we are very optimistic that there is a practicable solution that can achieve the Bay goals, and we appreciate the opportunity to submit the following comments on the draft TMDL:

1. **EPA should rectify the Chesapeake Bay Model based on the Phase 5.3mod urban acreages and reassess the TMDL load allocations based on the corrected output before the Phase I WIPs are finalized.**

Areas for impervious and pervious land will change drastically between version 5.3 (used to develop the current TMDL) and proposed 5.3mod of the Chesapeake Bay Model. Table 1 compares the acres of impervious and pervious surface in the Chesapeake Bay Watershed for the Phase 5.3 and proposed 5.3mod Models.

Table 1. Comparison of Impervious and Pervious Surface Areas for the Phase 5.3 and 5.3mod Models[1]

Model Version	Analysis Year	Impervious Surface (ac)	Pervious Surface (ac)
Phase 5.3	2002	675,917	1,885,935
Phase 5.3mod	2001	1,587,575	5,896,707
Phase 5.3mod*	2001	1,569,377	3,442,346

* (excluding suburb and rural wooded areas)

Table 1 shows a large increase in the total acres of impervious and pervious surfaces between the Phase 5.3 and 5.3mod versions of the Model. The effect that these changing impervious and pervious areas will have on the current nutrient loading rates and resulting sector loads is concerning. Since prior Model phases were calibrated against real-world data (i.e., mass pollutant loads), it is our understanding that the Model must be a zero-sum game in which the total load from all sources above any monitoring station must remain relatively constant. If,

[1] EPA provided WSSI (via e-mail) a memo titled, "Phase 5.3 (modified) 'Developed' and 'Extractive' Land Use Datasets," dated 5/25/2010 which included the data provided in Table 1.

5300 Wellington Branch Drive • Suite 100 • Gainesville, VA 20155 • Phone 703.679.5602 • Fax 703.679.5601
mrolband@wetlandstudies.com • www.wetlandstudies.com

in fact, the loading rates will only "change slightly,"[2] it is clear that new impervious and pervious areas will affect the Model's load from the urban sector significantly. The magnitude of this effect, however, is unknown.

This is a crucial issue for states developing Watershed Implementation Plans (WIPs) and finding ways to assure that funds are available to implement the plans based on specific impervious and pervious areas and "established" loading rates because the retrofit costs are directly proportional to areas. Loading rates also affect how stormwater regulations are developed and implemented at the local level (and EPA has approval authority over stormwater regulations through VSMP permits), and changes to loading rates will also impact sector allocations. For these reasons, the impervious and pervious areas should be revised *before* the Phase I WIPs are finalized.

2. EPA-implemented backstops for the urban sector should be based on acres rather than a percent of urban area because the effect of EPA's urban acreage revisions in 2011 could drastically alter the requirements and costs for the urban sector.

Both the EPA backstops and some of the draft State WIPs contained discussion of urban retrofits based on percentages of urban land instead of specific acreage requirements. EPA should define acreage requirements rather than percentage requirements for urban retrofits if backstops are implemented. The calculations for pervious and impervious urban acreage in the current Chesapeake Bay Community Watershed Model are in flux and are likely to increase substantially[3] (see comment #1, above). Therefore, all WIP provisions or EPA backstops that focus on restoration or retrofit of a percentage of urban area are likely to also increase substantially in area. Such increases will dramatically increase the requirements and costs on the urban sector.

3. EPA should use more precise soils source data to resolve upcoming issues with the development of States' local target loads in the Phase II WIPs.

The Chesapeake Bay Model uses NRCS State Soil Geographic (STATSGO) data[4], which isn't precise enough for local-level implementation. At the regional level, the use of STATSGO data provides an acceptable level of precision for modeling of the Bay Watershed; however, at the local level, the Model's underlying soils source data needs to be re-examined prior to the development of Phase II WIPs because data is available which provides a considerably higher level of detail at the local level [i.e. Soil Survey Geographic (SSURGO)].

Upon analysis and comparison of the Hydrologic Soil Group (HSG) data in Fairfax County, Virginia for both sources, it is clear that SSURGO provides a considerably more detailed and

---

[2] Based on an email received from Gary Shenk (EPA) by Mike Rolband (WSSI) on October 27, 2010.
[3] Based on an a memo dated 5/25/2010 received from Peter Claggett (USGS) to Mike Rolband (WSSI), pervious and impervious surfaces are likely to change by a factor of 2 to 3.
[4] Chesapeake Bay Model Phase 5 Documentation, Chapter 9 Sediment Simulation (downloaded on October 25, 2010, at: ftp://ftp.chesapeakebay.net/modeling/P5Documentation/SECTION%209.pdf) indicates that the soils data used for analysis was derived from the STATSGO Database.

accurate assessment of the soil types (Exhibit A). Additionally, when comparing the SSURGO and STATSGO data, it is clear that there are large discrepancies in the data. For example, the STATSGO data indicates that 78% of Fairfax County, Virginia is composed of Type B soils and 9% Type D soils; however, the SSURGO data indicates that Type B and D soils comprise 24% and 42% of the Watershed respectively (Table 2). A similar analysis was performed for the Chesapeake Bay Watershed (Exhibits B and C).

Table 2. Comparison of STATSGO versus SSURGO Soil Data for Fairfax County

STATSGO		HSG	SSURGO	
mi²	**% of watershed**		**% of watershed**	**mi²**
-	0%	A	0%	0.3
-	0%	A/D	0%	-
318.1	78%	B	24%	97.9
-	0%	B/D	0%	0.5
40.3	10%	C	12%	50.0
-	0%	C/D	1%	3.0
37.8	9%	D	42%	169.5
9.9	2%	Not Rated	21%	84.9
406.1	100%	Totals	100%	406.1

The differences in soil type composition will affect the runoff characteristics and pollutant loading rates at the local level. A comparison of the STATSGO and SURGO data sets for Fairfax County shows a significant difference in runoff when each soil type is assigned a hydraulic conductivity[5] value. The STATSGO data results in a weighted hydraulic conductivity of 2.87 in/hr, while the SSURGO data results in a weighted hydraulic conductivity of 1.02 in/hr for Fairfax County (Table 3).

[5] Hydraulic conductivity values were assigned using the following source: United States Department of Agriculture, Natural Resources Conservation Service (2007). National Engineering Handbook, Part 630 Hydrology, Chapter 7 Hydrologic Soil Groups. 210-VI-NEH. Where a range of hydraulic conductivity values was given, the average value for that soil group was used. For soil groups A/D, B/D, and C/D the average of the two soil groups was used.

Table 3. Comparison of Weighted Hydraulic Conductivity (HC) for Fairfax County Using STATSGO and SSURGO Soil Data

HSG	STATSGO			SSURGO		
	mi²	HC (in/hr)	Composite	mi²	HC (in/hr)	Composite
A	-	5.68	-	0	5.68	2
A/D	-	2.91	-	-	2.91	-
B	318	3.55	1128	98	3.55	347
B/D	-	1.84	-	1	1.84	1
C	40	0.78	31	50	0.78	39
C/D	-	0.46	-	3	0.46	1
D	38	0.14	5	170	0.14	24
Not Rated	10	0.00	-	85	0.00	-
Totals	406	2.87	1,164	406	1.02	414

The analysis in Exhibit C shows that modeling with STATSGO data at the Bay Watershed scale is appropriate, but using the same dataset to model at the local level (i.e. Fairfax County) will not provide appropriate level of precision for runoff and loading calculations. (The variations in data will be even more apparent at the site-specific scale.) For this reason, it will be important to correct this problem before the Phase II WIPs are written which require development of WIPs at the local level.

4. EPA should complete and finalize the Chesapeake Bay Model documentation prior to issuing the TMDL.

The Chesapeake Bay Model Documentation is not complete for the public to review and understand the Model. Not all chapters of the Chesapeake Bay Model are available on the Chesapeake Bay Program's website or ftp site (http://www.chesapeakebay.net/model_phase5.aspx?menuitem=26169; ftp://ftp.chesapeakebay.net/Modeling/P5Documentation/) and those that are available for review are incomplete (missing information, internal comments, etc. are present in the document). For example, in Section 9, tables 9.2.1.1 and 9.2.1.3 are missing (pages 5 and 7), and on page 10 an internal note is listed ("[Rob B. will provide the reference for this. On 3-14-08 Jeff S. was asked to update the information on this land use.]") The public should be able to review the document in its entirety before the TMDL is issued so that they can understand the TMDL development process and Model used to establish the TMDL load allocations.

In summary, the Chesapeake Bay Model should be improved based on the following recommendations:

1. Before the Phase I WIPs are finalized, the EPA should rectify the Chesapeake Bay Model based on the Phase 5.3mod urban acreages and reassess the TMDL load allocations based on the corrected output before the Phase I WIPs are finalized.

2. Any EPA-implemented backstops or Phase I WIPs for the urban sector should be based on acres rather than a percent of urban area because the effect of EPA's urban acreage revisions in 2011 could drastically alter the requirements and costs for the urban sector.

3. More precise soils source data should be used to resolve upcoming issues with the development of States' local target loads in the Phase II WIPs.

4. EPA should complete and finalize the Chesapeake Bay Model documentation prior to issuing the TMDL.

Again, we appreciate the opportunity to provide comments on the Chesapeake Bay Watershed TMDL. We believe that stakeholder involvement is important and will positively contribute to an equitable and cost-effective TMDL that will achieve the Bay goals, and we hope that these comments will help to improve the TMDL document. Please feel free to contact me with any questions or concerns (telephone: 703 679 5602; e-mail: mrolband@wetlandstudies.com).

Sincerely,

WETLAND STUDIES AND SOLUTIONS, INC.

Michael S. Rolband

Michael S. Rolband, P.E, P.W.S., P.W.D.
President

List of Exhibits

Exhibit A:
Hydrologic Soils Group Map for Fairfax County, Virginia, comparing STATSGO and SSURGO Data

Exhibit B:
Hydrologic Soils Group Map for the Chesapeake Bay Watershed comparing STATSGO and SSURGO Data

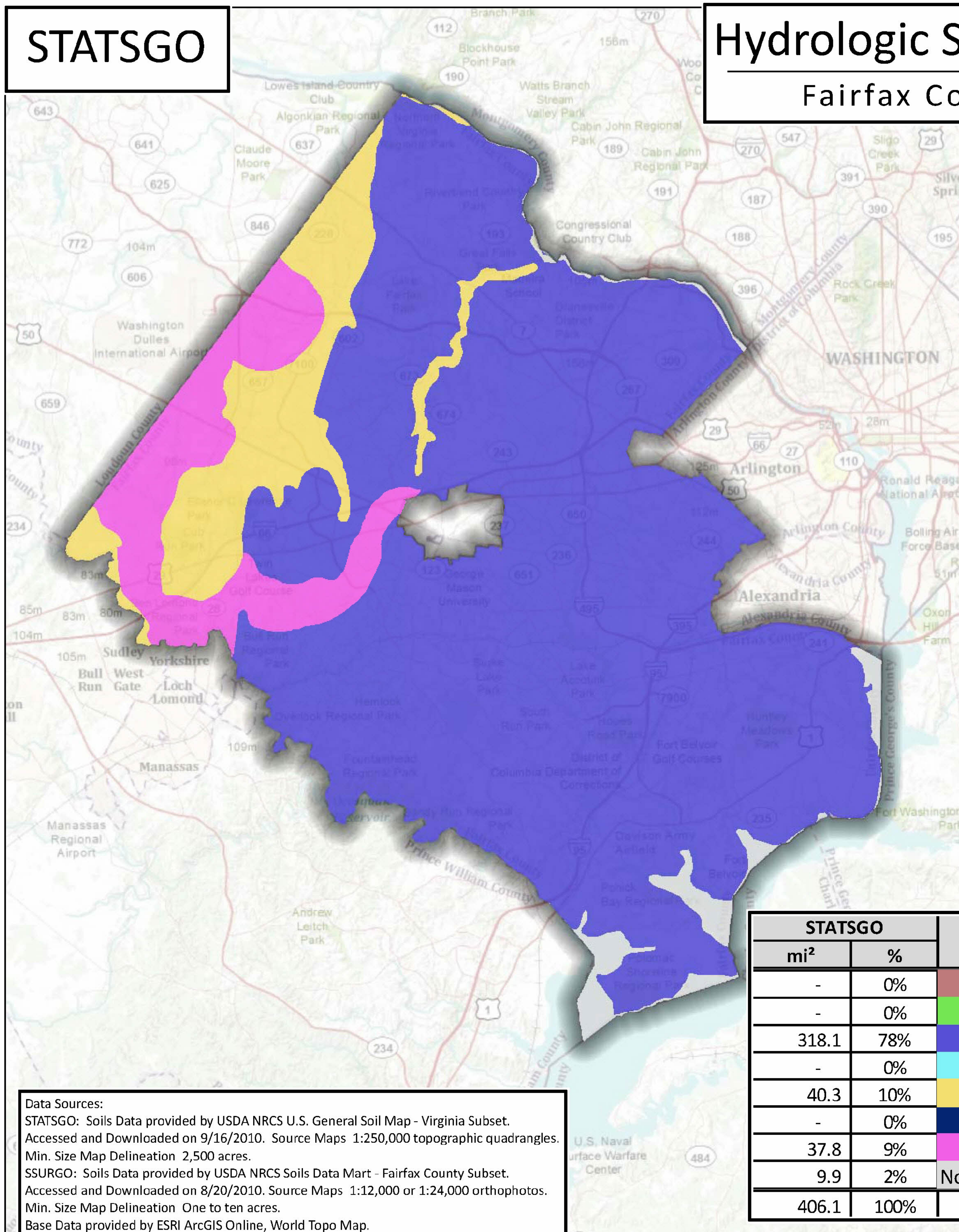
Exhibit C:
Comparison of STATSGO versus SSURGO Soil Data for the Chesapeake Bay Watershed
Comparison of Weighted Hydraulic Conductivity (HC) for the Chesapeake Bay Watershed using STATSGO and SSURGO soil data

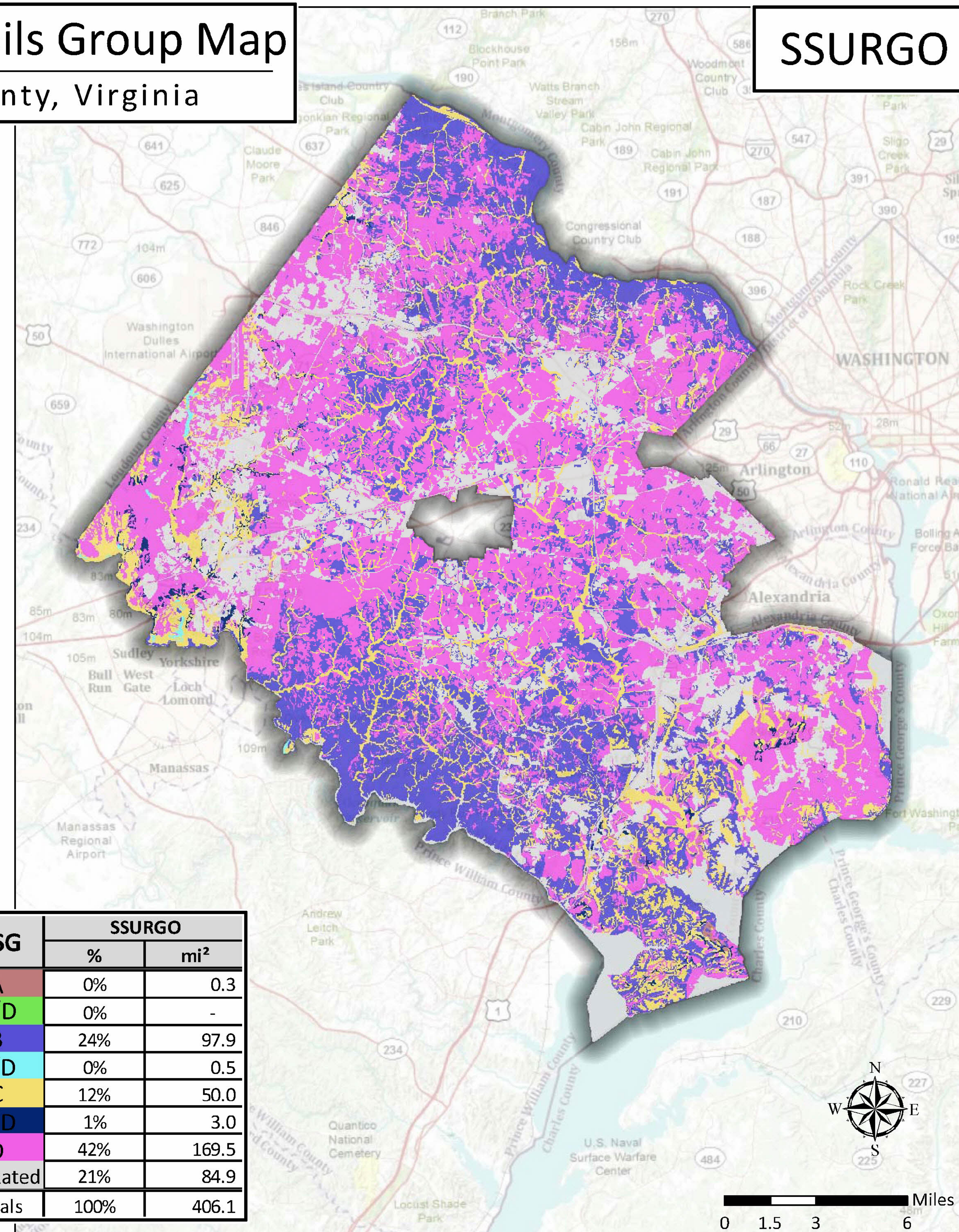
Exhibit A:

Hydrologic Soils Group Map for Fairfax County, Virginia comparing STATSGO and SSURGO Data

Hydrologic Soils Group Map

Fairfax County, Virginia





STATSGO		HSG	SSURGO	
mi²	%		%	mi²
-	0%	A	0%	0.3
-	0%	A/D	0%	-
318.1	78%	B	24%	97.9
-	0%	B/D	0%	0.5
40.3	10%	C	12%	50.0
-	0%	C/D	1%	3.0
37.8	9%	D	42%	169.5
9.9	2%	Not Rated	21%	84.9
406.1	100%	Totals	100%	406.1

Data Sources:
STATSGO: Soils Data provided by USDA NRCS U.S. General Soil Map - Virginia Subset.
Accessed and Downloaded on 9/16/2010. Source Maps 1:250,000 topographic quadrangles.
Min. Size Map Delineation 2,500 acres.
SSURGO: Soils Data provided by USDA NRCS Soils Data Mart - Fairfax County Subset.
Accessed and Downloaded on 8/20/2010. Source Maps 1:12,000 or 1:24,000 orthophotos.
Min. Size Map Delineation One to ten acres.
Base Data provided by ESRI ArcGIS Online, World Topo Map.

Wetland Studies and Solutions, Inc.

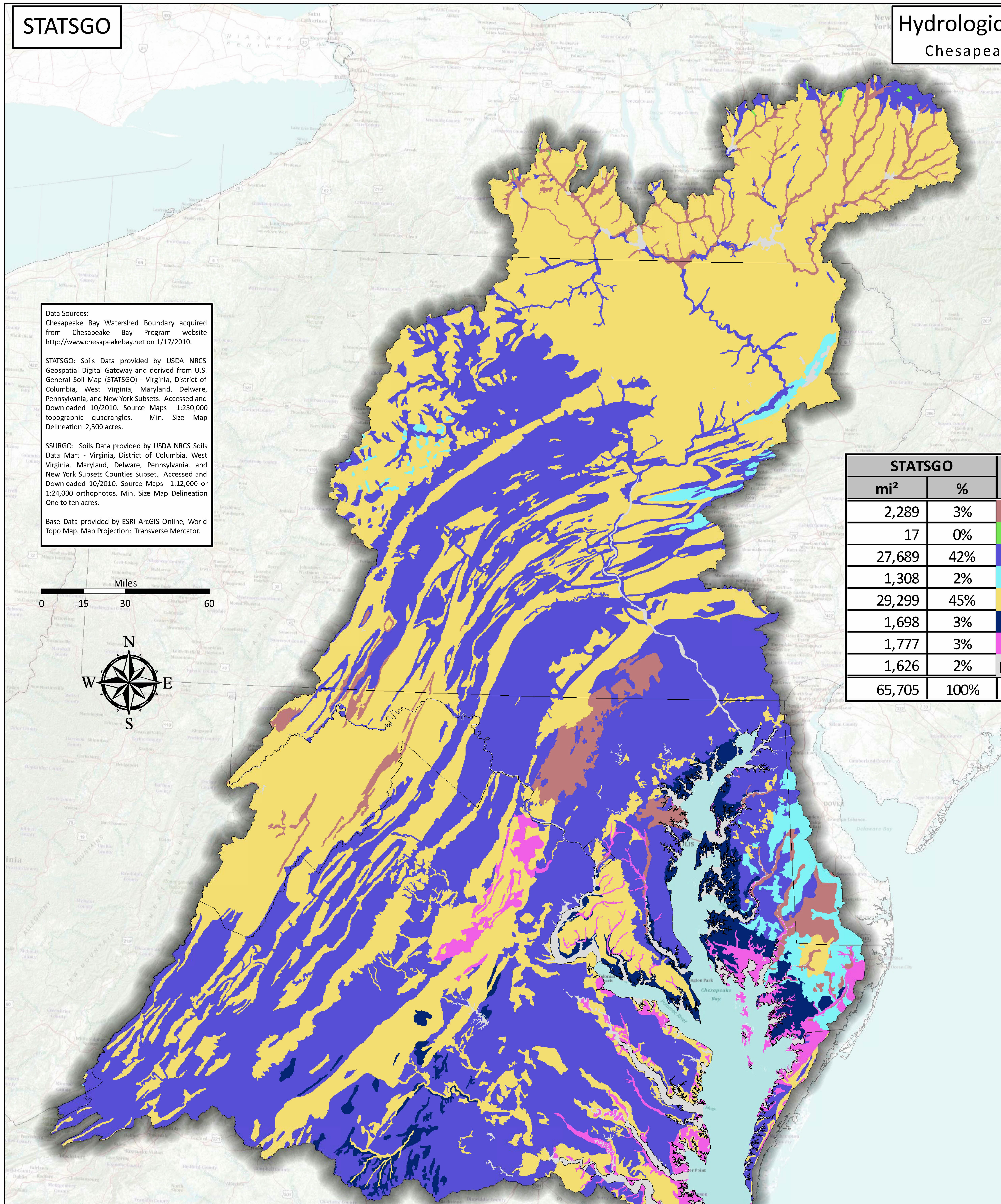
L:\21000s\21800\21863.01\GIS\HSG_Analysis\VA\HSG_FairfaxCo\FairfaxSoilsComparison.mxd

Exhibit B:

Hydrologic Soils Group Map for the Chesapeake Bay Watershed comparing STATSGO and SSURGO Data

Hydrologic Soils Group Map

Chesapeake Bay Watershed



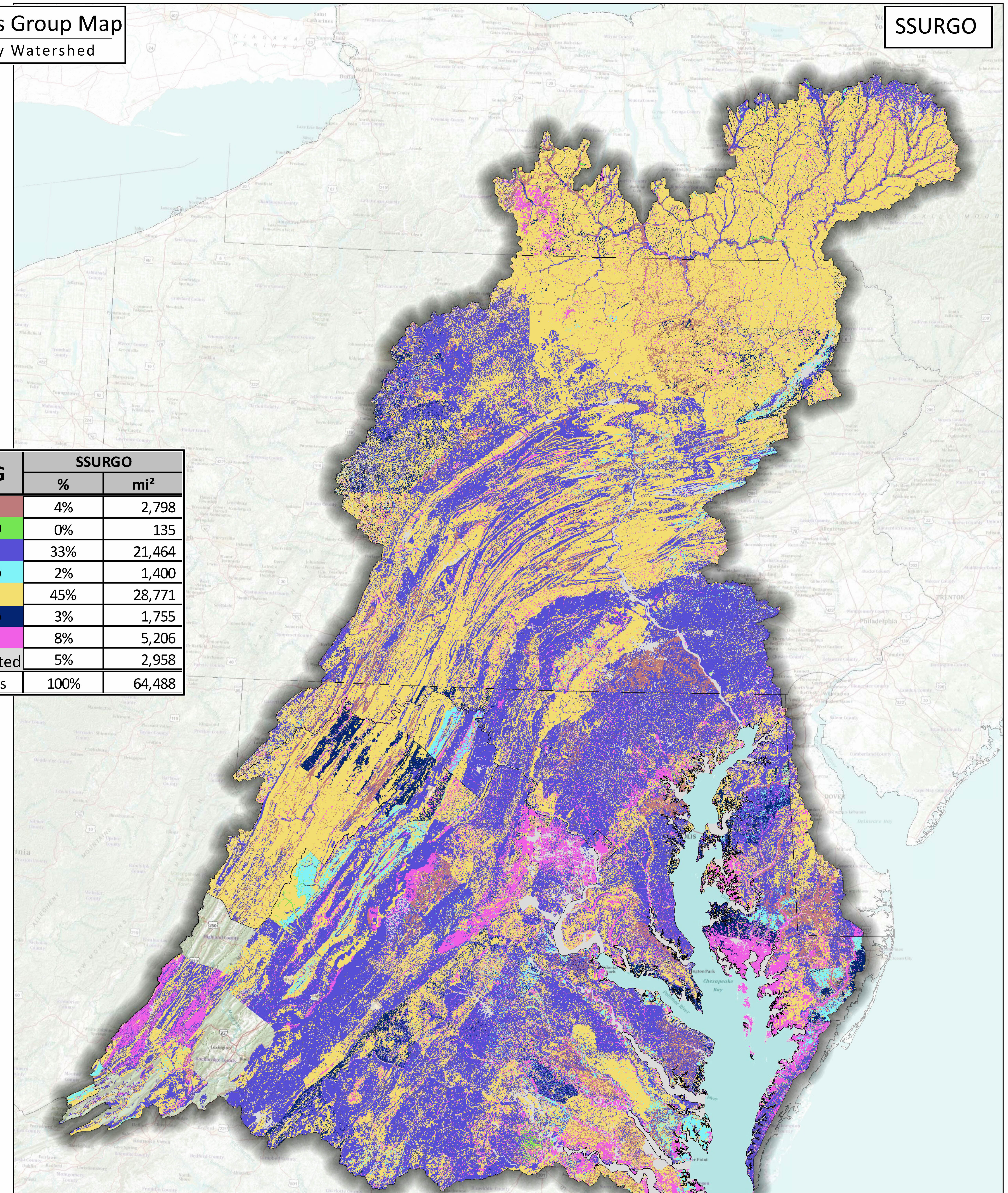
Data Sources:
Chesapeake Bay Watershed Boundary acquired from Chesapeake Bay Program website http://www.chesapeakebay.net on 1/17/2010.

STATSGO: Soils Data provided by USDA NRCS Geospatial Digital Gateway and derived from U.S. General Soil Map (STATSGO) - Virginia, District of Columbia, West Virginia, Maryland, Delware, Pennsylvania, and New York Subsets. Accessed and Downloaded 10/2010. Source Maps 1:250,000 topographic quadrangles. Min. Size Map Delineation 2,500 acres.

SSURGO: Soils Data provided by USDA NRCS Soils Data Mart - Virginia, District of Columbia, West Virginia, Maryland, Delware, Pennsylvania, and New York Subsets Counties Subset. Accessed and Downloaded 10/2010. Source Maps 1:12,000 or 1:24,000 orthophotos. Min. Size Map Delineation One to ten acres.

Base Data provided by ESRI ArcGIS Online, World Topo Map. Map Projection: Transverse Mercator.

STATSGO mi²	STATSGO %	HSG	SSURGO %	SSURGO mi²
2,289	3%	A	4%	2,798
17	0%	A/D	0%	135
27,689	42%	B	33%	21,464
1,308	2%	B/D	2%	1,400
29,299	45%	C	45%	28,771
1,698	3%	C/D	3%	1,755
1,777	3%	D	8%	5,206
1,626	2%	Not Rated	5%	2,958
65,705	100%	Totals	100%	64,488



STATSGO - Hydrologic Soils Groups Within the Chesapeake Bay Watershed

State	A		A/D		B		B/D		C		C/D		D		Not Rated		Totals	
	mi²	%	mi²	%	mi²	%	mi²	%	mi²	%	mi²	%	mi²	%	mi²	%	mi²	%
Virginia	16	0.1%	-	0.0%	13,180	58.6%	-	0.0%	6,881	30.6%	505	2.2%	1,233	5.5%	693	3.1%	22,508	100%
Maryland	885	8.9%	-	0.0%	4,186	42.1%	596	6.0%	1,844	18.6%	1,192	12.0%	543	5.5%	694	7.0%	9,940	100%
West Virginia	163	4.5%	-	0.0%	486	13.6%	1	0.0%	2,919	81.4%	-	0.0%	-	0.0%	16	0.5%	3,585	100%
Delaware	245	34.2%	-	0.0%	95	13.3%	356	49.7%	19	2.7%	-	0.0%	-	0.0%	0	0.0%	716	100%
New York	704	11.2%	17	0.1%	387	6.2%	-	0.0%	5,051	80.7%	-	0.0%	-	0.0%	103	1.7%	6,263	100%
Pennsylvania	271	1.2%	-	0.0%	9,329	41.2%	356	1.6%	12,555	55.5%	-	0.0%	-	0.0%	113	0.5%	22,624	100%
District of Columbia	5	7.1%	-	0.0%	26	37.4%	-	0.0%	30	43.8%	1	1.2%	1	2.0%	6	8.5%	69	100%
Totals	2,289	3.5%	17	0.1%	27,689	42.1%	1,308	2.0%	29,299	44.6%	1,698	2.6%	1,777	2.7%	1,626	2.5%	65,705	100%

SSURGO - Hydrologic Soils Groups Within the Chesapeake Bay Watershed

State	A		A/D		B		B/D		C		C/D		D		Not Rated		Totals	
	mi²	%	mi²	%	mi²	%	mi²	%	mi²	%	mi²	%	mi²	%	mi²	%	mi²	%
Virginia	568	2.7%	61	0.3%	8,915	41.9%	820	3.9%	6,524	30.6%	498	2.3%	2,517	11.8%	1,388	6.5%	21,292	100%
Maryland	469	4.7%	6	0.0%	4,016	40.4%	193	1.9%	2,797	28.1%	392	3.9%	1,209	12.2%	855	8.6%	9,936	100%
West Virginia	207	5.8%	-	0.0%	590	16.5%	115	3.2%	2,277	63.5%	218	6.1%	131	3.7%	47	1.3%	3,585	100%
Delaware	123	17.2%	-	0.0%	257	36.0%	-	0.0%	275	38.3%	-	0.0%	57	7.9%	4	0.6%	716	100%
New York	423	6.8%	64	0.3%	651	10.4%	13	0.2%	4,514	72.1%	178	2.8%	349	5.6%	70	1.1%	6,263	99%
Pennsylvania	1003	4.4%	4	0.0%	7,016	31.0%	258	1.1%	12,375	54.7%	467	2.1%	916	4.1%	586	2.6%	22,626	100%
District of Columbia	5	7.2%	-	0.0%	19	27.5%	0	0.0%	9	13.4%	1	2.0%	27	39.1%	7	10.6%	69	100%
Totals	2,798	4.3%	135	0.6%	21,464	33.3%	1,400	2.2%	28,771	44.6%	1,755	2.7%	5,206	8.1%	2,958	4.6%	64,488	100%

Wetland Studies and Solutions, Inc.

L:\21000s\21800\21863.01\GIS\HSG_Analysis\STATSGO_&_ChesBayComparison\ChesapeakeBaySoilsComparison.mxd

Exhibit C:

Comparison of STATSGO versus SSURGO Soil Data for the Chesapeake Bay Watershed

Comparison of Weighted Hydraulic Conductivity (HC) for the Chesapeake Bay Watershed using STATSGO and SSURGO soil data

Comparison of STATSGO versus SSURGO Soil Data for the Chesapeake Bay Watershed

STATSGO		HSG	SSURGO	
mi²	% of watershed		% of watershed	mi²
2,289	3%	A	4%	2,798
17	0%	A/D	0%	135
27,689	42%	B	33%	21,464
1,308	2%	B/D	2%	1,400
29,299	45%	C	45%	28,771
1,698	3%	C/D	3%	1,755
1,777	3%	D	8%	5,206
1,626	2%	Not Rated	5%	2,958
65,705	100%	Totals	100%	64,488

Comparison of Weighted Hydraulic Conductivity[1] (HC) for the Chesapeake Bay Watershed using STATSGO and SSURGO soil data

HSG	STATSGO			SSURGO		
	mi²	HC (in/hr)	Composite	mi²	HC (in/hr)	Composite
A	2,289	5.68	13,001	2,798	5.68	15,895
A/D	17	2.91	50	135	2.91	392
B	27,689	3.55	98,158	21,464	3.55	76,091
B/D	1,308	1.84	2,411	1,400	1.84	2,579
C	29,299	0.78	22,854	28,771	0.78	22,441
C/D	1,698	0.46	781	1,755	0.46	807
D	1,777	0.14	249	5,206	0.14	729
Not Rated	1,626	0.00	-	2,958	0.00	-
Totals	65,705	**2.09**	137,503	64,488	**1.84**	118,934

[1] Hydraulic conductivity values were assigned using the following source: United States Department of Agriculture, Natural Resources Conservation Service (2007). National Engineering Handbook, Part 630 Hydrology, Chapter 7 Hydrologic Soil Groups. 210-VI-NEH. Where a range of hydraulic conductivity values was given, the average value for that soil group was used. For soil groups A/D, B/D, and C/D the average of the two soil groups was used.